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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,138	01/07/2004	Francesco De Rege Thesauro	100185	4430
29050	7590	02/09/2005	EXAMINER	
STEVEN D WESEMAN, ASSOCIATE GENERAL COUNSEL, IP CABOT MICROELECTRONICS CORPORATION 870 NORTH COMMONS DRIVE AURORA, IL 60504			MULLER, BRYAN R	
			ART UNIT	PAPER NUMBER
			3723	

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/753,138

Applicant(s)

DE REGE THESAURO ET AL.

Examiner

Bryan R Muller

Art Unit

3723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 22-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 11, 16-18, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Li (Pub. No. 2002/0182982).
2. In reference to claim 1, Li discloses a polishing composition for use in a CMP polishing system, wherein the method of use comprises, including a substrate comprising a metal in oxidized form (copper oxide; paragraphs 42 and 43), contacting a portion of the substrate with a CMP polishing system comprising a polishing pad (paragraph 7) and a slurry (liquid carrier) with abrasive particles (paragraph 8) and a reducing agent (paragraph 62) therein and abrading at least a portion of the metal oxidized form to polish the substrate. Li further discloses that the reducing agent may be hydroxylamine (paragraph 62, lines 3 and 4).
3. In reference to claim 2, Li discloses that the polishing composition may be used on copper oxide, tantalum nitride, tungsten nitride or titanium nitride. All of which are oxidized metals in either oxide or nitride forms.
4. In reference to claim 3, the molecular formula for copper oxide is "CuO", which is equivalent to Cu₁O₁. Therefore, in the form M_xO_y y is equal to x.
5. In reference to claims 4 and 11, Li discloses that the polishing composition may be used to polish tantalum nitride, as discussed supra, which is tantalum in an oxidized form.

6. In reference to claims 16-18, Li discloses that the abrasive suspended in the liquid carrier (slurry), may include silica (paragraph 63).

7. In reference to claim 20, Li discloses that the reducing agent may be hydroxylamine, as discussed supra.

8. In reference to claim 21, Li discloses that the reducing agent may comprise between 0.01-20 weight % of the complexing solution (paragraph 62) and the complexing solution comprises about 0.5% of the polishing composition. Therefore, if the reducing agent was 20% of the complexing solution, then it would be 0.1% of the polishing composition.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5-9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (Pub. No. 2002/0182982) in view of Hartner (Pub. No. 2002/0086511).

11. In reference to claims 5, 6 and 12, Li discloses the method of polishing a substrate as discussed supra, but fails to disclose that the metal may be noble metal or that the oxidized metal may be iridium oxide. Hartner discloses a method for fabricating a patterned layer on a substrate that incorporates a step of chemical mechanical polishing a layer of iridium oxide (paragraphs 43 and 44) to produce a layer on the

substrate that is self-aligned and self-patterned. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the oxidized metal to be polished may have been iridium oxide as used in the method of Hartner to produce a layer on the substrate that is self-aligned and self-patterned. This would have been advantageous because the pattern would not have to be etched, which is difficult and creates another step in the process, thus saving time and increasing production.

12. In reference to claims 7-9, 13 and 14, Li discloses that the reducing agent may be hydroxylamine and that the abrasive disposed in the liquid carrier may be silica, as discussed supra.

13. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li (Pub. No. 2002/0182982) in view of Rosenflanz (6,454,822).

14. Li discloses the method of polishing a substrate as discussed supra and that the abrasive particles may be alumina (paragraph 63), but fails to disclose that the abrasive particles may be α -alumina. Rosenflanz discloses that sol-gel-derived α -alumina particles have a longer abrasive life on metal than conventional alumina particles (col. 2, lines 13-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use sol-gel-derived α -alumina particles instead of the alumina particles disclosed by Li, to provide a longer life for the particle as taught by Rosenflanz.

15.

16. Claims 10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (Pub. No. 2002/0182982) in view of Hartner (Pub. No. 2002/0086511) as applied to claims 8 and 13 respectively, and further in view of Rosenflanz (6,454,822).

17. The obvious combination of Li and Hartner fails to disclose that the abrasive particles may be α -alumina. Rosenflanz discloses an advantage to using α -alumina over alumina particles, as discussed supra. Therefore, it would have been obvious to use α -alumina particles over the alumina particles disclosed by Li, as discussed supra.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tsai (Pub. No. 2003/0012287), Kitayama (Pub. No. 2004/0132385), Small (Pub. No. 2004/0029495) and Beitel (Pub. No. 2002/0042208) all disclose methods for polishing materials using polishing compositions comprising materials similar or the same as those disclosed in the application.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan R Muller whose telephone number is (703)305-0487. The examiner can normally be reached on M-F.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph J Hail III can be reached on (703)308-2687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3723

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BRM BRM
1/24/2005



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